



**PATENT**  
Attorney Docket No. EPICEN-09587

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of: Davydova *et al.* Group No.: 1652  
Serial No.: 10/743,975 Examiner: Hutson, R.  
Filed: 12/23/03  
Entitled: **Target-Dependent Transcription Using Deletion Mutants  
of N4 RNA Polymerase**

**CERTIFICATE RE: SEQUENCE LISTING**

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Dated: 04/03/07

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# SEQUENCE LISTING

<110> Davydova, Elena K.  
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Jendrisak, Jerome J.

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Ile Ile Ser Asp Gly Leu Ala Glu Gly Val Gly Ser Leu Leu Gly Ala  
 225 230 235 240

Gly Pro Val Leu Arg Gly Ala Ser Leu Leu Gly Lys Ala Val Val Pro  
 245 250 255

Ala Asn Thr Leu Arg Ser Ala Ala Leu Ala Gly Ala Ile Asp Ala Gly  
 260 265 270

Thr Gly Thr Gln Ser Leu Ala Arg Ile Ala Ser Thr Val Gly Arg Ala  
 275 280 285

Ala Pro Gly Met Val Gly Val Gly Ala Met Glu Ala Gly Gly Ala Tyr  
 290 295 300

Gln Gln Thr Ala Asp Glu Ile Met Lys Met Ser Leu Lys Asp Leu Glu  
 305 310 315 320

Lys Ser Pro Val Tyr Gln Gln His Ile Lys Asp Gly Met Ser Pro Glu  
 325 330 335

Gln Ala Arg Arg Gln Thr Ala Ser Glu Thr Gly Leu Thr Ala Ala Ala  
 340 345 350

Ile Gln Leu Pro Ile Ala Ala Ala Thr Gly Pro Leu Val Ser Arg Phe  
 355 360 365

Glu Met Ala Pro Phe Arg Ala Gly Ser Leu Gly Ala Val Gly Met Asn  
 370 375 380

Leu Ala Arg Glu Thr Val Glu Glu Gly Val Gln Gly Ala Thr Gly Gln  
 385 390 395 400

Leu Ala Gln Asn Ile Ala Gln Gln Gln Asn Ile Asp Lys Asn Gln Asp  
 405 410 415

Leu Leu Lys Gly Val Gly Thr Gln Ala Gly Leu Gly Ala Leu Tyr Gly  
 420 425 430

Phe Gly Ser Ala Gly Val Val Gln Ala Pro Ala Gly Ala Ala Arg Leu  
 435 440 445

Ala Gly Ala Ala Thr Ala Pro Val Leu Arg Thr Thr Met Ala Gly Val  
 450 455 460

Lys Ala Ala Gly Ser Val Ala Gly Lys Val Val Ser Pro Ile Lys Asn  
 465 470 475 480

Thr Leu Val Ala Arg Gly Glu Arg Val Met Lys Gln Asn Glu Glu Ala  
 485 490 495

Ser Pro Val Ala Asp Asp Tyr Val Ala Gln Ala Ala Gln Glu Ala Met  
500 505 510

Ala Gln Ala Pro Glu Ala Glu Val Thr Ile Arg Asp Ala Val Glu Ala  
515 520 525

Thr Asp Ala Thr Pro Glu Gln Lys Val Ala Ala His Gln Tyr Val Ser  
530 535 540

Asp Leu Met Asn Ala Thr Arg Phe Asn Pro Glu Asn Tyr Gln Glu Ala  
545 550 555 560

Pro Glu His Ile Arg Asn Ala Val Ala Gly Ser Thr Asp Gln Val Gln  
565 570 575

Val Ile Gln Lys Leu Ala Asp Leu Val Asn Thr Leu Asp Glu Ser Asn  
580 585 590

Pro Gln Ala Leu Met Glu Ala Ala Ser Tyr Met Tyr Asp Ala Val Ser  
595 600 605

Glu Phe Glu Gln Phe Ile Asn Arg Asp Pro Ala Ala Leu Asp Ser Ile  
610 615 620

Pro Lys Asp Ser Pro Ala Ile Glu Leu Leu Asn Arg Tyr Thr Asn Leu  
625 630 635 640

Thr Ala Asn Ile Gln Asn Thr Pro Lys Val Ile Gly Ala Leu Asn Val  
645 650 655

Ile Asn Arg Met Ile Asn Glu Ser Ala Gln Asn Gly Ser Leu Asn Val  
660 665 670

Thr Glu Glu Ser Ser Pro Gln Glu Met Gln Asn Val Ala Leu Ala Ala  
675 680 685

Glu Val Ala Pro Glu Lys Leu Asn Pro Glu Ser Val Asn Val Val Leu  
690 695 700

Lys His Ala Ala Asp Gly Arg Ile Lys Leu Asn Asn Arg Gln Ile Ala  
705 710 715 720

Ala Leu Gln Asn Ala Ala Ala Ile Leu Lys Gly Ala Arg Glu Tyr Asp  
725 730 735

Ala Glu Ala Ala Arg Leu Gly Leu Arg Pro Gln Asp Ile Val Ser Lys  
740 745 750

Gln Ile Lys Thr Asp Glu Ser Arg Thr Gln Glu Gly Gln Tyr Ser Ala  
755 760 765

Leu Gln His Ala Asn Arg Ile Arg Ser Ala Tyr Asn Ser Gly Asn Phe  
770 775 780

Glu Leu Ala Ser Ala Tyr Leu Asn Asp Phe Met Gln Phe Ala Gln His  
785 790 795 800

Met Gln Asn Lys Val Gly Ala Leu Asn Glu His Leu Val Thr Gly Asn  
805 810 815

Ala Asp Lys Asn Lys Ser Val His Tyr Gln Ala Leu Thr Ala Asp Arg  
820 825 830

Glu Trp Val Arg Ser Arg Thr Gly Leu Gly Val Asn Pro Tyr Asp Thr  
835 840 845

Lys Ser Val Lys Phe Ala Gln Gln Val Ala Leu Glu Ala Lys Thr Val  
850 855 860

Ala Asp Ile Ala Asn Ala Leu Ala Ser Ala Tyr Pro Glu Leu Lys Val  
865 870 875 880

Ser His Ile Lys Val Thr Pro Leu Asp Ser Arg Leu Asn Ala Pro Ala  
885 890 895

Ala Glu Val Val Lys Ala Phe Arg Gln Gly Asn Arg Asp Val Ala Ser  
900 905 910

Ser Gln Pro Lys Ala Asp Ser Val Asn Gln Val Lys Glu Thr Pro Val  
915 920 925

Thr Lys Gln Glu Pro Val Thr Ser Thr Val Gln Thr Lys Thr Pro Val  
930 935 940

Ser Glu Ser Val Lys Thr Glu Pro Thr Thr Lys Glu Ser Ser Pro Gln  
 945 950 955 960

Ala Ile Lys Glu Pro Val Asn Gln Ser Glu Lys Gln Asp Val Asn Leu  
 965 970 975

Thr Asn Glu Asp Asn Ile Lys Gln Pro Thr Glu Ser Val Lys Glu Thr  
 980 985 990

Glu Thr Ser Thr Lys Glu Ser Thr Val Thr Glu Glu Leu Lys Glu Gly  
 995 1000 1005

Ile Asp Ala Val Tyr Pro Ser Leu Val Gly Thr Ala Asp Ser Lys  
 1010 1015 1020

Ala Glu Gly Ile Lys Asn Tyr Phe Lys Leu Ser Phe Thr Leu Pro  
 1025 1030 1035

Glu Glu Gln Lys Ser Arg Thr Val Gly Ser Glu Ala Pro Leu Lys  
 1040 1045 1050

Asp Val Ala Gln Ala Leu Ser Ser Arg Ala Arg Tyr Glu Leu Phe  
 1055 1060 1065

Thr Glu Lys Glu Thr Ala Asn Pro Ala Phe Asn Gly Glu Val Ile  
 1070 1075 1080

Lys Arg Tyr Lys Glu Leu Met Glu His Gly Glu Gly Ile Ala Asp  
 1085 1090 1095

Ile Leu Arg Ser Arg Leu Ala Lys Phe Leu Asn Thr Lys Asp Val  
 1100 1105 1110

Gly Lys Arg Phe Ala Gln Gly Thr Glu Ala Asn Arg Trp Val Gly  
 1115 1120 1125

Gly Lys Leu Leu Asn Ile Val Glu Gln Asp Gly Asp Thr Phe Lys  
 1130 1135 1140

Tyr Asn Glu Gln Leu Leu Gln Thr Ala Val Leu Ala Gly Leu Gln  
 1145 1150 1155

Trp	Arg	Leu	Thr	Ala	Thr	Ser	Asn	Thr	Ala	Ile	Lys	Asp	Ala	Lys
	1160						1165					1170		
Asp	Val	Ala	Ala	Ile	Thr	Gly	Ile	Asp	Gln	Ala	Leu	Leu	Pro	Glu
	1175						1180					1185		
Gly	Leu	Val	Glu	Gln	Phe	Asp	Thr	Gly	Met	Thr	Leu	Thr	Glu	Ala
	1190						1195					1200		
Val	Ser	Ser	Leu	Ala	Gln	Lys	Ile	Glu	Ser	Tyr	Trp	Gly	Leu	Ser
	1205						1210					1215		
Arg	Asn	Pro	Asn	Ala	Pro	Leu	Gly	Tyr	Thr	Lys	Gly	Ile	Pro	Thr
	1220						1225					1230		
Ala	Met	Ala	Ala	Glu	Ile	Leu	Ala	Ala	Phe	Val	Glu	Ser	Thr	Asp
	1235						1240					1245		
Val	Val	Glu	Asn	Ile	Val	Asp	Met	Ser	Glu	Ile	Asp	Pro	Asp	Asn
	1250						1255					1260		
Lys	Lys	Thr	Ile	Gly	Leu	Tyr	Thr	Ile	Thr	Glu	Leu	Asp	Ser	Phe
	1265						1270					1275		
Asp	Pro	Ile	Asn	Ser	Phe	Pro	Thr	Ala	Ile	Glu	Glu	Ala	Val	Leu
	1280						1285					1290		
Val	Asn	Pro	Thr	Glu	Lys	Met	Phe	Phe	Gly	Asp	Asp	Ile	Pro	Pro
	1295						1300					1305		
Val	Ala	Asn	Thr	Gln	Leu	Arg	Asn	Pro	Ala	Val	Arg	Asn	Thr	Pro
	1310						1315					1320		
Glu	Gln	Lys	Ala	Ala	Leu	Lys	Ala	Glu	Gln	Ala	Thr	Glu	Phe	Tyr
	1325						1330					1335		
Val	His	Thr	Pro	Met	Val	Gln	Phe	Tyr	Glu	Thr	Leu	Gly	Lys	Asp
	1340						1345					1350		
Arg	Ile	Leu	Glu	Leu	Met	Gly	Ala	Gly	Thr	Leu	Asn	Lys	Glu	Leu
	1355						1360					1365		

Leu	Asn	Asp	Asn	His	Ala	Lys	Ser	Leu	Glu	Gly	Lys	Asn	Arg	Ser
1370						1375					1380			
Val	Glu	Asp	Ser	Tyr	Asn	Gln	Leu	Phe	Ser	Val	Ile	Glu	Gln	Val
1385						1390					1395			
Arg	Ala	Gln	Ser	Glu	Asp	Ile	Ser	Thr	Val	Pro	Ile	His	Tyr	Ala
1400						1405					1410			
Tyr	Asn	Met	Thr	Arg	Val	Gly	Arg	Met	Gln	Met	Leu	Gly	Lys	Tyr
1415						1420					1425			
Asn	Pro	Gln	Ser	Ala	Lys	Leu	Val	Arg	Glu	Ala	Ile	Leu	Pro	Thr
1430						1435					1440			
Lys	Ala	Thr	Leu	Asp	Leu	Ser	Asn	Gln	Asn	Asn	Glu	Asp	Phe	Ser
1445						1450					1455			
Ala	Phe	Gln	Leu	Gly	Leu	Ala	Gln	Ala	Leu	Asp	Ile	Lys	Val	His
1460						1465					1470			
Thr	Met	Thr	Arg	Glu	Val	Met	Ser	Asp	Glu	Leu	Thr	Lys	Leu	Leu
1475						1480					1485			
Glu	Gly	Asn	Leu	Lys	Pro	Ala	Ile	Asp	Met	Met	Val	Glu	Phe	Asn
1490						1495					1500			
Thr	Thr	Gly	Ser	Leu	Pro	Glu	Asn	Ala	Val	Asp	Val	Leu	Asn	Thr
1505						1510					1515			
Ala	Leu	Gly	Asp	Arg	Lys	Ser	Phe	Val	Ala	Leu	Met	Ala	Leu	Met
1520						1525					1530			
Glu	Tyr	Ser	Arg	Tyr	Leu	Val	Ala	Glu	Asp	Lys	Ser	Ala	Phe	Val
1535						1540					1545			
Thr	Pro	Leu	Tyr	Val	Glu	Ala	Asp	Gly	Val	Thr	Asn	Gly	Pro	Ile
1550						1555					1560			
Asn	Ala	Met	Met	Leu	Met	Thr	Gly	Gly	Leu	Phe	Thr	Pro	Asp	Trp
1565						1570					1575			

Ile	Arg	Asn	Ile	Ala	Lys	Gly	Gly	Leu	Phe	Ile	Gly	Ser	Pro	Asn
1580						1585					1590			
Lys	Thr	Met	Asn	Glu	His	Arg	Ser	Thr	Ala	Asp	Asn	Asn	Asp	Leu
1595						1600					1605			
Tyr	Gln	Ala	Ser	Thr	Asn	Ala	Leu	Met	Glu	Ser	Leu	Gly	Lys	Leu
1610						1615					1620			
Arg	Ser	Asn	Tyr	Ala	Ser	Asn	Met	Pro	Ile	Gln	Ser	Gln	Ile	Asp
1625						1630					1635			
Ser	Leu	Leu	Ser	Leu	Met	Asp	Leu	Phe	Leu	Pro	Asp	Ile	Asn	Leu
1640						1645					1650			
Gly	Glu	Asn	Gly	Ala	Leu	Glu	Leu	Lys	Arg	Gly	Ile	Ala	Lys	Asn
1655						1660					1665			
Pro	Leu	Thr	Ile	Thr	Ile	Tyr	Gly	Ser	Gly	Ala	Arg	Gly	Ile	Ala
1670						1675					1680			
Gly	Lys	Leu	Val	Ser	Ser	Val	Thr	Asp	Ala	Ile	Tyr	Glu	Arg	Met
1685						1690					1695			
Ser	Asp	Val	Leu	Lys	Ala	Arg	Ala	Lys	Asp	Pro	Asn	Ile	Ser	Ala
1700						1705					1710			
Ala	Met	Ala	Met	Phe	Gly	Lys	Gln	Ala	Ala	Ser	Glu	Ala	His	Ala
1715						1720					1725			
Glu	Glu	Leu	Leu	Ala	Arg	Phe	Leu	Lys	Asp	Met	Glu	Thr	Leu	Thr
1730						1735					1740			
Ser	Thr	Val	Pro	Val	Lys	Arg	Lys	Gly	Val	Leu	Glu	Leu	Gln	Ser
1745						1750					1755			
Thr	Gly	Thr	Gly	Ala	Lys	Gly	Lys	Ile	Asn	Pro	Lys	Thr	Tyr	Thr
1760						1765					1770			
Ile	Lys	Gly	Glu	Gln	Leu	Lys	Ala	Leu	Gln	Glu	Asn	Met	Leu	His
1775						1780					1785			



Phe	Phe	Val	Glu	Pro	Leu	Arg	Asn	Gly	Ile	Thr	Gln	Thr	Val	Gly
1790						1795					1800			
Glu	Ser	Leu	Val	Tyr	Ser	Thr	Glu	Gln	Leu	Gln	Lys	Ala	Thr	Gln
1805						1810					1815			
Ile	Gln	Ser	Val	Val	Leu	Glu	Asp	Met	Phe	Lys	Gln	Arg	Val	Gln
1820						1825					1830			
Glu	Lys	Leu	Ala	Glu	Lys	Ala	Lys	Asp	Pro	Thr	Trp	Lys	Lys	Gly
1835						1840					1845			
Asp	Phe	Leu	Thr	Gln	Lys	Glu	Leu	Asn	Asp	Ile	Gln	Ala	Ser	Leu
1850						1855					1860			
Asn	Asn	Leu	Ala	Pro	Met	Ile	Glu	Thr	Gly	Ser	Gln	Thr	Phe	Tyr
1865						1870					1875			
Ile	Ala	Gly	Ser	Glu	Asn	Ala	Glu	Val	Ala	Asn	Gln	Val	Leu	Ala
1880						1885					1890			
Thr	Asn	Leu	Asp	Asp	Arg	Met	Arg	Val	Pro	Met	Ser	Ile	Tyr	Ala
1895						1900					1905			
Pro	Ala	Gln	Ala	Gly	Val	Ala	Gly	Ile	Pro	Phe	Met	Thr	Ile	Gly
1910						1915					1920			
Thr	Gly	Asp	Gly	Met	Met	Met	Gln	Thr	Leu	Ser	Thr	Met	Lys	Gly
1925						1930					1935			
Ala	Pro	Lys	Asn	Thr	Leu	Lys	Ile	Phe	Asp	Gly	Met	Asn	Ile	Gly
1940						1945					1950			
Leu	Asn	Asp	Ile	Thr	Asp	Ala	Ser	Arg	Lys	Ala	Asn	Glu	Ala	Val
1955						1960					1965			
Tyr	Thr	Ser	Trp	Gln	Gly	Asn	Pro	Ile	Lys	Asn	Val	Tyr	Glu	Ser
1970						1975					1980			
Tyr	Ala	Lys	Phe	Met	Lys	Asn	Val	Asp	Phe	Ser	Lys	Leu	Ser	Pro
1985						1990					1995			

Glu	Ala	Leu	Glu	Ala	Ile	Gly	Lys	Ser	Ala	Leu	Glu	Tyr	Asp	Gln
2000						2005					2010			
Arg	Glu	Asn	Ala	Thr	Val	Asp	Asp	Ile	Ala	Asn	Ala	Ala	Ser	Leu
2015						2020					2025			
Ile	Glu	Arg	Asn	Leu	Arg	Asn	Ile	Ala	Leu	Gly	Val	Asp	Ile	Arg
2030						2035					2040			
His	Lys	Val	Leu	Asp	Lys	Val	Asn	Leu	Ser	Ile	Asp	Gln	Met	Ala
2045						2050					2055			
Ala	Val	Gly	Ala	Pro	Tyr	Gln	Asn	Asn	Gly	Lys	Ile	Asp	Leu	Ser
2060						2065					2070			
Asn	Met	Thr	Pro	Glu	Gln	Gln	Ala	Asp	Glu	Leu	Asn	Lys	Leu	Phe
2075						2080					2085			
Arg	Glu	Glu	Leu	Glu	Ala	Arg	Lys	Gln	Lys	Val	Ala	Lys	Ala	Arg
2090						2095					2100			
Ala	Glu	Val	Lys	Glu	Glu	Thr	Val	Ser	Glu	Lys	Glu	Pro	Val	Asn
2105						2110					2115			
Pro	Asp	Phe	Gly	Met	Val	Gly	Arg	Glu	His	Lys	Ala	Ser	Gly	Val
2120						2125					2130			
Arg	Ile	Leu	Ser	Ala	Thr	Ala	Ile	Arg	Asn	Leu	Ala	Lys	Ile	Ser
2135						2140					2145			
Asn	Leu	Pro	Ser	Thr	Gln	Ala	Ala	Thr	Leu	Ala	Glu	Ile	Gln	Lys
2150						2155					2160			
Ser	Leu	Ala	Ala	Lys	Asp	Tyr	Lys	Ile	Ile	Tyr	Gly	Thr	Pro	Thr
2165						2170					2175			
Gln	Val	Ala	Glu	Tyr	Ala	Arg	Gln	Lys	Asn	Val	Thr	Glu	Leu	Thr
2180						2185					2190			
Ser	Gln	Glu	Met	Glu	Glu	Ala	Gln	Ala	Gly	Asn	Ile	Tyr	Gly	Trp
2195						2200					2205			

Thr	Asn	Phe	Asp	Asp	Lys	Thr	Ile	Tyr	Leu	Val	Ser	Pro	Ser	Met
2210						2215					2220			
Glu	Thr	Leu	Ile	His	Glu	Leu	Val	His	Ala	Ser	Thr	Phe	Glu	Glu
2225						2230					2235			
Val	Tyr	Ser	Phe	Tyr	Gln	Gly	Asn	Glu	Val	Ser	Pro	Thr	Ser	Lys
2240						2245					2250			
Gln	Ala	Ile	Glu	Asn	Leu	Glu	Gly	Leu	Met	Glu	Gln	Phe	Arg	Ser
2255						2260					2265			
Leu	Asp	Ile	Ser	Lys	Asp	Ser	Pro	Glu	Met	Arg	Glu	Ala	Tyr	Ala
2270						2275					2280			
Asp	Ala	Ile	Ala	Thr	Ile	Glu	Gly	His	Leu	Ser	Asn	Gly	Phe	Val
2285						2290					2295			
Asp	Pro	Ala	Ile	Ser	Lys	Ala	Ala	Ala	Leu	Asn	Glu	Phe	Met	Ala
2300						2305					2310			
Trp	Gly	Leu	Ala	Asn	Arg	Ala	Leu	Ala	Ala	Lys	Gln	Lys	Arg	Thr
2315						2320					2325			
Ser	Ser	Leu	Val	Gln	Met	Val	Lys	Asp	Val	Tyr	Gln	Ala	Ile	Lys
2330						2335					2340			
Lys	Leu	Ile	Trp	Gly	Arg	Lys	Gln	Ala	Pro	Ala	Leu	Gly	Glu	Asp
2345						2350					2355			
Met	Phe	Ser	Asn	Leu	Leu	Phe	Asn	Ser	Ala	Ile	Leu	Met	Arg	Ser
2360						2365					2370			
Gln	Pro	Thr	Thr	Gln	Ala	Val	Ala	Lys	Asp	Gly	Thr	Leu	Phe	His
2375						2380					2385			
Ser	Lys	Ala	Tyr	Gly	Asn	Asn	Glu	Arg	Leu	Ser	Gln	Leu	Asn	Gln
2390						2395					2400			
Thr	Phe	Asp	Lys	Leu	Val	Thr	Asp	Tyr	Leu	Arg	Thr	Asp	Pro	Val
2405						2410					2415			

Thr	Glu	Val	Glu	Arg	Arg	Gly	Asn	Val	Ala	Asn	Ala	Leu	Met	Ser
2420						2425					2430			
Ala	Thr	Arg	Leu	Val	Arg	Asp	Val	Gln	Ser	His	Gly	Phe	Asn	Met
2435						2440					2445			
Thr	Ala	Gln	Glu	Gln	Ser	Val	Phe	Gln	Met	Val	Thr	Ala	Ala	Leu
2450						2455					2460			
Ala	Thr	Glu	Ala	Ala	Ile	Asp	Pro	His	Ala	Met	Ala	Arg	Ala	Gln
2465						2470					2475			
Glu	Leu	Tyr	Thr	His	Val	Met	Lys	His	Leu	Thr	Val	Glu	His	Phe
2480						2485					2490			
Met	Ala	Asp	Pro	Asp	Ser	Thr	Asn	Pro	Ala	Asp	Arg	Tyr	Tyr	Ala
2495						2500					2505			
Gln	Gln	Lys	Tyr	Asp	Thr	Ile	Ser	Gly	Ala	Asn	Leu	Val	Glu	Val
2510						2515					2520			
Asp	Ala	Lys	Gly	Arg	Thr	Ser	Leu	Leu	Pro	Thr	Phe	Leu	Gly	Leu
2525						2530					2535			
Ala	Met	Val	Asn	Glu	Glu	Leu	Arg	Ser	Ile	Ile	Lys	Glu	Met	Pro
2540						2545					2550			
Val	Pro	Lys	Ala	Asp	Lys	Lys	Leu	Gly	Asn	Asp	Ile	Asp	Thr	Leu
2555						2560					2565			
Leu	Thr	Asn	Ala	Gly	Thr	Gln	Val	Met	Glu	Ser	Leu	Asn	Arg	Arg
2570						2575					2580			
Met	Ala	Gly	Asp	Gln	Lys	Ala	Thr	Asn	Val	Gln	Asp	Ser	Ile	Asp
2585						2590					2595			
Ala	Leu	Ser	Glu	Thr	Ile	Met	Ala	Ala	Ala	Leu	Lys	Arg	Glu	Ser
2600						2605					2610			
Phe	Tyr	Asp	Ala	Val	Ala	Thr	Pro	Thr	Gly	Asn	Phe	Ile	Asp	Arg
2615						2620					2625			

Ala	Asn	Gln	Tyr	Val	Thr	Asp	Ser	Ile	Glu	Arg	Leu	Ser	Glu	Thr
2630						2635					2640			
Val	Ile	Glu	Lys	Ala	Asp	Lys	Val	Ile	Ala	Asn	Pro	Ser	Asn	Ile
2645						2650					2655			
Ala	Ala	Lys	Gly	Val	Ala	His	Leu	Ala	Lys	Leu	Thr	Ala	Ala	Ile
2660						2665					2670			
Ala	Ser	Glu	Lys	Gln	Gly	Glu	Ile	Val	Ala	Gln	Gly	Val	Met	Thr
2675						2680					2685			
Ala	Met	Asn	Gln	Gly	Lys	Val	Trp	Gln	Pro	Phe	His	Asp	Leu	Val
2690						2695					2700			
Asn	Asp	Ile	Val	Gly	Arg	Thr	Lys	Thr	Asn	Ala	Asn	Val	Tyr	Asp
2705						2710					2715			
Leu	Ile	Lys	Leu	Val	Lys	Ser	Gln	Ile	Ser	Gln	Asp	Arg	Gln	Gln
2720						2725					2730			
Phe	Arg	Glu	His	Leu	Pro	Thr	Val	Ile	Ala	Gly	Lys	Phe	Ser	Arg
2735						2740					2745			
Lys	Leu	Thr	Asp	Thr	Glu	Trp	Ser	Ala	Met	His	Thr	Gly	Leu	Gly
2750						2755					2760			
Lys	Thr	Asp	Leu	Ala	Val	Leu	Arg	Glu	Thr	Met	Ser	Met	Ala	Glu
2765						2770					2775			
Ile	Arg	Asp	Leu	Leu	Ser	Ser	Ser	Lys	Lys	Val	Lys	Asp	Glu	Ile
2780						2785					2790			
Ser	Thr	Leu	Glu	Lys	Glu	Ile	Gln	Asn	Gln	Ala	Gly	Arg	Asn	Trp
2795						2800					2805			
Asn	Leu	Val	Gln	Lys	Lys	Ser	Lys	Gln	Leu	Ala	Gln	Tyr	Met	Ile
2810						2815					2820			
Met	Gly	Glu	Val	Gly	Asn	Asn	Leu	Leu	Arg	Asn	Ala	His	Ala	Ile
2825						2830					2835			

Ser	Arg	Leu	Leu	Gly	Glu	Arg	Ile	Thr	Asn	Gly	Pro	Val	Ala	Asp
2840						2845					2850			
Val	Ala	Ala	Ile	Asp	Lys	Leu	Ile	Thr	Leu	Tyr	Ser	Leu	Glu	Leu
2855						2860					2865			
Met	Asn	Lys	Ser	Asp	Arg	Asp	Leu	Leu	Ser	Glu	Leu	Ala	Gln	Ser
2870						2875					2880			
Glu	Val	Glu	Gly	Met	Glu	Phe	Ser	Ile	Ala	Tyr	Met	Val	Gly	Gln
2885						2890					2895			
Arg	Thr	Glu	Glu	Met	Arg	Lys	Ala	Lys	Gly	Asp	Asn	Arg	Thr	Leu
2900						2905					2910			
Leu	Asn	His	Phe	Lys	Gly	Tyr	Ile	Pro	Val	Glu	Asn	Gln	Gln	Gly
2915						2920					2925			
Val	Asn	Leu	Ile	Ile	Ala	Asp	Asp	Lys	Glu	Phe	Ala	Lys	Leu	Asn
2930						2935					2940			
Ser	Gln	Ser	Phe	Thr	Arg	Ile	Gly	Thr	Tyr	Gln	Gly	Ser	Thr	Gly
2945						2950					2955			
Phe	Arg	Thr	Gly	Ser	Lys	Gly	Tyr	Tyr	Phe	Ser	Pro	Val	Ala	Ala
2960						2965					2970			
Arg	Ala	Pro	Tyr	Ser	Gln	Gly	Ile	Leu	Gln	Asn	Val	Arg	Asn	Thr
2975						2980					2985			
Ala	Gly	Gly	Val	Asp	Ile	Gly	Thr	Gly	Phe	Thr	Leu	Gly	Thr	Met
2990						2995					3000			
Val	Ala	Gly	Arg	Ile	Thr	Asp	Lys	Pro	Thr	Val	Glu	Arg	Ile	Thr
3005						3010					3015			
Lys	Ala	Leu	Ala	Lys	Gly	Glu	Arg	Gly	Arg	Glu	Pro	Leu	Met	Pro
3020						3025					3030			
Ile	Tyr	Asn	Ser	Lys	Gly	Gln	Val	Val	Ala	Tyr	Glu	Gln	Ser	Val
3035						3040					3045			

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Ala	Gln	Arg	Phe	Asn	Asp	Ile	Leu	Ile	Glu	Gln	Leu	His	Ala	Met
3080						3085					3090			
Tyr	Glu	Lys	Asp	Ile	Lys	Asp	Ser	Ser	Ala	Asn	Lys	Ser	Gln	Tyr
3095						3100					3105			
Val	Asn	Leu	Leu	Gly	Lys	Ile	Asp	Asp	Pro	Val	Leu	Ala	Asp	Ala
3110						3115					3120			
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3125						3130					3135			
Phe	Gly	Lys	Asp	Glu	Leu	Trp	Val	Arg	Arg	Asp	Met	Leu	Asn	Asp
3140						3145					3150			
Ala	Leu	Gly	Tyr	Arg	Ala	Ala	Ser	Ile	Gly	Asp	Val	Trp	Thr	Gly
3155						3160					3165			
Asn	Ser	Arg	Trp	Ser	Pro	Ser	Thr	Leu	Asp	Thr	Val	Lys	Lys	Met
3170						3175					3180			
Phe	Leu	Gly	Ala	Phe	Gly	Asn	Lys	Ala	Tyr	His	Val	Val	Met	Asn
3185						3190					3195			
Ala	Glu	Asn	Thr	Ile	Gln	Asn	Leu	Val	Lys	Asp	Ala	Lys	Thr	Val
3200						3205					3210			
Ile	Val	Val	Lys	Ser	Val	Val	Val	Pro	Ala	Val	Asn	Phe	Leu	Ala
3215						3220					3225			
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3230						3235					3240			
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 Ile Glu Ala Gly Glu Phe Ser Ser Ile Ala Asp Ala Gly Ile Ser  
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 Arg Asp Asp Leu Leu Val Ala Glu Gly Lys Ile His Glu Tyr Met  
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 Glu Lys Leu Ala Asn Lys Leu Pro Glu Lys Val Arg Asn Ala Gly  
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 Arg Tyr Ala Leu Ile Ala Lys Asp Thr Ala Leu Phe Gln Gly Ile  
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 Gln Lys Thr Val Glu Tyr Ser Asp Phe Ile Ala Lys Ala Ile Ile  
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 Tyr Asp Asp Leu Val Lys Arg Lys Lys Lys Ser Ser Ser Glu Ala  
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 Leu Gly Gln Val Thr Glu Glu Phe Ile Asn Tyr Asp Arg Leu Pro  
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 Tyr Asn Phe Lys Ile Arg Ser Ile Lys Val Ala Met Ser Met Ile  
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 Arg Asn Asn Pro Val His Ser Leu Ile Ala Thr Val Val Pro Ala  
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Leu Thr Met Leu Ala Glu Gly Arg Leu Asp Tyr Ser Leu Gly Phe  
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 35 40 45

Thr Val Gly Ser Glu Ala Pro Leu Lys Asp Val Ala Gln Ala Leu Ser  
 50 55 60

Ser Arg Ala Arg Tyr Glu Leu Phe Thr Glu Lys Glu Thr Ala Asn Pro  
 65 70 75 80

Ala Phe Asn Gly Glu Val Ile Lys Arg Tyr Lys Glu Leu Met Glu His  
 85 90 95

Gly Glu Gly Ile Ala Asp Ile Leu Arg Ser Arg Leu Ala Lys Phe Leu  
 100 105 110

Asn Thr Lys Asp Val Gly Lys Arg Phe Ala Gln Gly Thr Glu Ala Asn  
115 120 125

Arg Trp Val Gly Gly Lys Leu Leu Asn Ile Val Glu Gln Asp Gly Asp  
130 135 140

Thr Phe Lys Tyr Asn Glu Gln Leu Leu Gln Thr Ala Val Leu Ala Gly  
145 150 155 160

Leu Gln Trp Arg Leu Thr Ala Thr Ser Asn Thr Ala Ile Lys Asp Ala  
165 170 175

Lys Asp Val Ala Ala Ile Thr Gly Ile Asp Gln Ala Leu Leu Pro Glu  
180 185 190

Gly Leu Val Glu Gln Phe Asp Thr Gly Met Thr Leu Thr Glu Ala Val  
195 200 205

Ser Ser Leu Ala Gln Lys Ile Glu Ser Tyr Trp Gly Leu Ser Arg Asn  
210 215 220

Pro Asn Ala Pro Leu Gly Tyr Thr Lys Gly Ile Pro Thr Ala Met Ala  
225 230 235 240

Ala Glu Ile Leu Ala Ala Phe Val Glu Ser Thr Asp Val Val Glu Asn  
245 250 255

Ile Val Asp Met Ser Glu Ile Asp Pro Asp Asn Lys Lys Thr Ile Gly  
260 265 270

Leu Tyr Thr Ile Thr Glu Leu Asp Ser Phe Asp Pro Ile Asn Ser Phe  
275 280 285

Pro Thr Ala Ile Glu Glu Ala Val Leu Val Asn Pro Thr Glu Lys Met  
290 295 300

Phe Phe Gly Asp Asp Ile Pro Pro Val Ala Asn Thr Gln Leu Arg Asn  
305 310 315 320

Pro Ala Val Arg Asn Thr Pro Glu Gln Lys Ala Ala Leu Lys Ala Glu  
325 330 335

Gln Ala Thr Glu Phe Tyr Val His Thr Pro Met Val Gln Phe Tyr Glu  
 340 345 350

Thr Leu Gly Lys Asp Arg Ile Leu Glu Leu Met Gly Ala Gly Thr Leu  
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Asn Lys Glu Leu Leu Asn Asp Asn His Ala Lys Ser Leu Glu Gly Lys  
 370 375 380

Asn Arg Ser Val Glu Asp Ser Tyr Asn Gln Leu Phe Ser Val Ile Glu  
 385 390 395 400

Gln Val Arg Ala Gln Ser Glu Asp Ile Ser Thr Val Pro Ile His Tyr  
 405 410 415

Ala Tyr Asn Met Thr Arg Val Gly Arg Met Gln Met Leu Gly Lys Tyr  
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Asn Pro Gln Ser Ala Lys Leu Val Arg Glu Ala Ile Leu Pro Thr Lys  
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Ala Thr Leu Asp Leu Ser Asn Gln Asn Asn Glu Asp Phe Ser Ala Phe  
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Gln Leu Gly Leu Ala Gln Ala Leu Asp Ile Lys Val His Thr Met Thr  
 465 470 475 480

Arg Glu Val Met Ser Asp Glu Leu Thr Lys Leu Leu Glu Gly Asn Leu  
 485 490 495

Lys Pro Ala Ile Asp Met Met Val Glu Phe Asn Thr Thr Gly Ser Leu  
 500 505 510

Pro Glu Asn Ala Val Asp Val Leu Asn Thr Ala Leu Gly Asp Arg Lys  
 515 520 525

Ser Phe Val Ala Leu Met Ala Leu Met Glu Tyr Ser Arg Tyr Leu Val  
 530 535 540

Ala Glu Asp Lys Ser Ala Phe Val Thr Pro Leu Tyr Val Glu Ala Asp  
 545 550 555 560

Gly Val Thr Asn Gly Pro Ile Asn Ala Met Met Leu Met Thr Gly Gly  
565 570 575

Leu Phe Thr Pro Asp Trp Ile Arg Asn Ile Ala Lys Gly Gly Leu Phe  
580 585 590

Ile Gly Ser Pro Asn Lys Thr Met Asn Glu His Arg Ser Thr Ala Asp  
595 600 605

Asn Asn Asp Leu Tyr Gln Ala Ser Thr Asn Ala Leu Met Glu Ser Leu  
610 615 620

Gly Lys Leu Arg Ser Asn Tyr Ala Ser Asn Met Pro Ile Gln Ser Gln  
625 630 635 640

Ile Asp Ser Leu Leu Ser Leu Met Asp Leu Phe Leu Pro Asp Ile Asn  
645 650 655

Leu Gly Glu Asn Gly Ala Leu Glu Leu Lys Arg Gly Ile Ala Lys Asn  
660 665 670

Pro Leu Thr Ile Thr Ile Tyr Gly Ser Gly Ala Arg Gly Ile Ala Gly  
675 680 685

Lys Leu Val Ser Ser Val Thr Asp Ala Ile Tyr Glu Arg Met Ser Asp  
690 695 700

Val Leu Lys Ala Arg Ala Lys Asp Pro Asn Ile Ser Ala Ala Met Ala  
705 710 715 720

Met Phe Gly Lys Gln Ala Ala Ser Glu Ala His Ala Glu Glu Leu Leu  
725 730 735

Ala Arg Phe Leu Lys Asp Met Glu Thr Leu Thr Ser Thr Val Pro Val  
740 745 750

Lys Arg Lys Gly Val Leu Glu Leu Gln Ser Thr Gly Thr Gly Ala Lys  
755 760 765

Gly Lys Ile Asn Pro Lys Thr Tyr Thr Ile Lys Gly Glu Gln Leu Lys  
770 775 780

Ala Leu Gln Glu Asn Met Leu His Phe Phe Val Glu Pro Leu Arg Asn  
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Gly Ile Thr Gln Thr Val Gly Glu Ser Leu Val Tyr Ser Thr Glu Gln  
 805 810 815

Leu Gln Lys Ala Thr Gln Ile Gln Ser Val Val Leu Glu Asp Met Phe  
 820 825 830

Lys Gln Arg Val Gln Glu Lys Leu Ala Glu Lys Ala Lys Asp Pro Thr  
 835 840 845

Trp Lys Lys Gly Asp Phe Leu Thr Gln Lys Glu Leu Asn Asp Ile Gln  
 850 855 860

Ala Ser Leu Asn Asn Leu Ala Pro Met Ile Glu Thr Gly Ser Gln Thr  
 865 870 875 880

Phe Tyr Ile Ala Gly Ser Glu Asn Ala Glu Val Ala Asn Gln Val Leu  
 885 890 895

Ala Thr Asn Leu Asp Asp Arg Met Arg Val Pro Met Ser Ile Tyr Ala  
 900 905 910

Pro Ala Gln Ala Gly Val Ala Gly Ile Pro Phe Met Thr Ile Gly Thr  
 915 920 925

Gly Asp Gly Met Met Met Gln Thr Leu Ser Thr Met Lys Gly Ala Pro  
 930 935 940

Lys Asn Thr Leu Lys Ile Phe Asp Gly Met Asn Ile Gly Leu Asn Asp  
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Ile Thr Asp Ala Ser Arg Lys Ala Asn Glu Ala Val Tyr Thr Ser Trp  
 965 970 975

Gln Gly Asn Pro Ile Lys Asn Val Tyr Glu Ser Tyr Ala Lys Phe Met  
 980 985 990

Lys Asn Val Asp Phe Ser Lys Leu Ser Pro Glu Ala Leu Glu Ala Ile  
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Gly Lys Ser Ala Leu Glu Tyr Asp Gln Arg Glu Asn Ala Thr Val  
 1010 1015 1020

Asp Asp Ile Ala Asn Ala Ala Ser Leu Ile Glu Arg Asn Leu Arg  
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Asn Ile Ala Leu Gly Val Asp Ile Arg His Lys Val Leu Asp Lys  
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Val Asn Leu Ser Ile Asp Gln Met Ala Ala Val Gly Ala Pro Tyr  
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Gln Asn Asn Gly Lys Ile Asp Leu Ser Asn Met Thr Pro Glu Gln  
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Gln Ala Asp Glu Leu Asn Lys Leu Phe Arg Glu Glu Leu Glu Ala  
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aaggctaggt aa 3432

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<212> PRT
<213> Artificial Sequence

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<220>
<223> Synthetic

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<400> 6

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 35 40 45

Ile Asp Ala Val Tyr Pro Ser Leu Val Gly Thr Ala Asp Ser Lys Ala  
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Glu Gly Ile Lys Asn Tyr Phe Lys Leu Ser Phe Thr Leu Pro Glu Glu  
 65 70 75 80

Gln Lys Ser Arg Thr Val Gly Ser Glu Ala Pro Leu Lys Asp Val Ala  
 85 90 95

Gln Ala Leu Ser Ser Arg Ala Arg Tyr Glu Leu Phe Thr Glu Lys Glu  
 100 105 110

Thr Ala Asn Pro Ala Phe Asn Gly Glu Val Ile Lys Arg Tyr Lys Glu  
 115 120 125

Leu Met Glu His Gly Glu Gly Ile Ala Asp Ile Leu Arg Ser Arg Leu  
 130 135 140

Ala Lys Phe Leu Asn Thr Lys Asp Val Gly Lys Arg Phe Ala Gln Gly  
 145 150 155 160

Thr Glu Ala Asn Arg Trp Val Gly Gly Lys Leu Leu Asn Ile Val Glu  
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Gln Asp Gly Asp Thr Phe Lys Tyr Asn Glu Gln Leu Leu Gln Thr Ala  
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Val Leu Ala Gly Leu Gln Trp Arg Leu Thr Ala Thr Ser Asn Thr Ala  
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Ile Lys Asp Ala Lys Asp Val Ala Ala Ile Thr Gly Ile Asp Gln Ala  
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Leu Leu Pro Glu Gly Leu Val Glu Gln Phe Asp Thr Gly Met Thr Leu  
 225 230 235 240

Thr Glu Ala Val Ser Ser Leu Ala Gln Lys Ile Glu Ser Tyr Trp Gly  
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Thr Ala Met Ala Ala Glu Ile Leu Ala Ala Phe Val Glu Ser Thr Asp  
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Val Val Glu Asn Ile Val Asp Met Ser Glu Ile Asp Pro Asp Asn Lys  
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Lys Thr Ile Gly Leu Tyr Thr Ile Thr Glu Leu Asp Ser Phe Asp Pro  
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Ile Asn Ser Phe Pro Thr Ala Ile Glu Glu Ala Val Leu Val Asn Pro  
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Thr Glu Lys Met Phe Phe Gly Asp Asp Ile Pro Pro Val Ala Asn Thr  
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Gln Leu Arg Asn Pro Ala Val Arg Asn Thr Pro Glu Gln Lys Ala Ala  
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Leu Lys Ala Glu Gln Ala Thr Glu Phe Tyr Val His Thr Pro Met Val  
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Gln Phe Tyr Glu Thr Leu Gly Lys Asp Arg Ile Leu Glu Leu Met Gly  
385 390 395 400

Ala Gly Thr Leu Asn Lys Glu Leu Leu Asn Asp Asn His Ala Lys Ser  
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Leu Glu Gly Lys Asn Arg Ser Val Glu Asp Ser Tyr Asn Gln Leu Phe  
420 425 430

Ser Val Ile Glu Gln Val Arg Ala Gln Ser Glu Asp Ile Ser Thr Val  
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Pro Ile His Tyr Ala Tyr Asn Met Thr Arg Val Gly Arg Met Gln Met  
450 455 460

Leu Gly Lys Tyr Asn Pro Gln Ser Ala Lys Leu Val Arg Glu Ala Ile  
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Leu Pro Thr Lys Ala Thr Leu Asp Leu Ser Asn Gln Asn Asn Glu Asp  
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Ser Thr Ala Asp Asn Asn Asp Leu Tyr Gln Ala Ser Thr Asn Ala Leu  
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Met Glu Ser Leu Gly Lys Leu Arg Ser Asn Tyr Ala Ser Asn Met Pro  
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Ile Gln Ser Gln Ile Asp Ser Leu Leu Ser Leu Met Asp Leu Phe Leu  
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Pro Asp Ile Asn Leu Gly Glu Asn Gly Ala Leu Glu Leu Lys Arg Gly  
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Gly Ile Ala Gly Lys Leu Val Ser Ser Val Thr Asp Ala Ile Tyr Glu  
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Arg Met Ser Asp Val Leu Lys Ala Arg Ala Lys Asp Pro Asn Ile Ser  
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Pro Leu Arg Asn Gly Ile Thr Gln Thr Val Gly Glu Ser Leu Val Tyr  
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Ser Thr Glu Gln Leu Gln Lys Ala Thr Gln Ile Gln Ser Val Val Leu  
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Lys Gly Ala Pro Lys Asn Thr Leu Lys Ile Phe Asp Gly Met Asn Ile  
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Gly Leu Asn Asp Ile Thr Asp Ala Ser Arg Lys Ala Asn Glu Ala Val  
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Ala Val Gly Ala Pro Tyr Gln Asn Asn Gly Lys Ile Asp Leu Ser  
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Ile Asp Ala Val Tyr Pro Ser Leu Val Gly Thr Ala Asp Ser Lys Ala  
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Glu Gly Ile Lys Asn Tyr Phe Lys Leu Ser Phe Thr Leu Pro Glu Glu  
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Gln Lys Ser Arg Thr Val Gly Ser Glu Ala Pro Leu Lys Asp Val Ala  
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Gln Ala Leu Ser Ser Arg Ala Arg Tyr Glu Leu Phe Thr Glu Lys Glu  
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Thr Glu Ala Asn Arg Trp Val Gly Gly Lys Leu Leu Asn Ile Val Glu  
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Val Leu Ala Gly Leu Gln Trp Arg Leu Thr Ala Thr Ser Asn Thr Ala  
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Ile Lys Asp Ala Lys Asp Val Ala Ala Ile Thr Gly Ile Asp Gln Ala  
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Thr Glu Ala Val Ser Ser Leu Ala Gln Lys Ile Glu Ser Tyr Trp Gly  
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Thr Ala Met Ala Ala Glu Ile Leu Ala Ala Phe Val Glu Ser Thr Asp  
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Lys Thr Ile Gly Leu Tyr Thr Ile Thr Glu Leu Asp Ser Phe Asp Pro  
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Ala Gly Thr Leu Asn Lys Glu Leu Leu Asn Asp Asn His Ala Lys Ser  
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Leu Glu Gly Lys Asn Arg Ser Val Glu Asp Ser Tyr Asn Gln Leu Phe  
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Ser Val Ile Glu Gln Val Arg Ala Gln Ser Glu Asp Ile Ser Thr Val  
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Pro Ile His Tyr Ala Tyr Asn Met Thr Arg Val Gly Arg Met Gln Met  
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Leu Gly Lys Tyr Asn Pro Gln Ser Ala Lys Leu Val Arg Glu Ala Ile  
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Leu Pro Thr Lys Ala Thr Leu Asp Leu Ser Asn Gln Asn Asn Glu Asp  
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Phe Ser Ala Phe Gln Leu Gly Leu Ala Gln Ala Leu Asp Ile Lys Val  
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Gly Asp Arg Lys Ser Phe Val Ala Leu Met Ala Leu Met Glu Tyr Ser  
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Met Thr Gly Gly Leu Phe Thr Pro Asp Trp Ile Arg Asn Ile Ala Lys  
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Ile Gln Ser Gln Ile Asp Ser Leu Leu Ser Leu Met Asp Leu Phe Leu  
675 680 685

Pro Asp Ile Asn Leu Gly Glu Asn Gly Ala Leu Glu Leu Lys Arg Gly  
690 695 700

Ile Ala Lys Asn Pro Leu Thr Ile Thr Ile Phe Gly Ser Gly Ala Arg  
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Gly Ile Ala Gly Lys Leu Val Ser Ser Val Thr Asp Ala Ile Tyr Glu  
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Thr Gly Ala Lys Gly Lys Ile Asn Pro Lys Thr Tyr Thr Ile Lys Gly  
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Glu Gln Leu Lys Ala Leu Gln Glu Asn Met Leu His Phe Phe Val Glu  
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Pro Leu Arg Asn Gly Ile Thr Gln Thr Val Gly Glu Ser Leu Val Tyr  
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Ser Thr Glu Gln Leu Gln Lys Ala Thr Gln Ile Gln Ser Val Val Leu  
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Glu Asp Met Phe Lys Gln Arg Val Gln Glu Lys Leu Ala Glu Lys Ala  
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Lys Asp Pro Thr Trp Lys Lys Gly Asp Phe Leu Thr Gln Lys Glu Leu  
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Lys Gly Ala Pro Lys Asn Thr Leu Lys Ile Phe Asp Gly Met Asn Ile  
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Gly Leu Asn Asp Ile Thr Asp Ala Ser Arg Lys Ala Asn Glu Ala Val  
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Tyr Thr Ser Trp Gln Gly Asn Pro Ile Lys Asn Val Tyr Glu Ser  
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Tyr Ala Lys Phe Met Lys Asn Val Asp Phe Ser Lys Leu Ser Pro  
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Ile Glu Arg Asn Leu Arg Asn Ile Ala Leu Gly Val Asp Ile Arg  
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His Lys Val Leu Asp Lys Val Asn Leu Ser Ile Asp Gln Met Ala  
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Ala Val Gly Ala Pro Tyr Gln Asn Asn Gly Lys Ile Asp Leu Ser  
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1175						1180					1185			
Ala	Val	Leu	Ala	Gly	Leu	Gln	Trp	Arg	Leu	Thr	Ala	Thr	Ser	Asn
1190						1195					1200			
Thr	Ala	Ile	Lys	Asp	Ala	Lys	Asp	Val	Ala	Ala	Ile	Thr	Gly	Ile
1205						1210					1215			
Asp	Gln	Ala	Leu	Leu	Pro	Glu	Gly	Leu	Val	Glu	Gln	Phe	Asp	Thr
1220						1225					1230			
Gly	Met	Thr	Leu	Thr	Glu	Ala	Val	Ser	Ser	Leu	Ala	Gln	Lys	Ile
1235						1240					1245			
Glu	Ser	Tyr	Trp	Gly	Leu	Ser	Arg	Asn	Pro	Asn	Ala	Pro	Leu	Gly
1250						1255					1260			
Tyr	Thr	Lys	Gly	Ile	Pro	Thr	Ala	Met	Ala	Ala	Glu	Ile	Leu	Ala
1265						1270					1275			
Ala	Phe	Val	Glu	Ser	Thr	Asp	Val	Val	Glu	Asn	Ile	Val	Asp	Met
1280						1285					1290			
Ser	Glu	Ile	Asp	Pro	Asp	Asn	Lys	Lys	Thr	Ile	Gly	Leu	Tyr	Thr
1295						1300					1305			

Ile Thr	Glu Leu Asp Ser	Phe	Asp Pro Ile Asn Ser	Phe Pro Thr
1310		1315		1320
Ala Ile	Glu Glu Ala Val	Leu	Val Asn Pro Thr	Glu Lys Met Phe
1325		1330		1335
Phe Gly	Asp Asp Ile Pro	Pro	Val Ala Asn Thr	Gln Leu Arg Asn
1340		1345		1350
Pro Ala	Val Arg Asn Thr	Pro	Glu Gln Lys Ala	Ala Leu Lys Ala
1355		1360		1365
Glu Gln	Ala Thr Glu Phe	Tyr	Val His Thr Pro	Met Val Gln Phe
1370		1375		1380
Tyr Glu	Thr Leu Gly Lys	Asp	Arg Ile Leu Glu	Leu Met Gly Ala
1385		1390		1395
Gly Thr	Leu Asn Lys Glu	Leu	Leu Asn Asp Asn	His Ala Lys Ser
1400		1405		1410
Leu Glu	Gly Lys Asn Arg	Ser	Val Glu Asp Ser	Tyr Asn Gln Leu
1415		1420		1425
Phe Ser	Val Ile Glu Gln	Val	Arg Ala Gln Ser	Glu Asp Ile Ser
1430		1435		1440
Thr Val	Pro Ile His Tyr	Ala	Tyr Asn Met Thr	Arg Val Gly Arg
1445		1450		1455
Met Gln	Met Leu Gly Lys	Tyr	Asn Pro Gln Ser	Ala Lys Leu Val
1460		1465		1470
Arg Glu	Ala Ile Leu Pro	Thr	Lys Ala Thr Leu	Asp Leu Ser Asn
1475		1480		1485
Gln Asn	Asn Glu Asp Phe	Ser	Ala Phe Gln Leu	Gly Leu Ala Gln
1490		1495		1500
Ala Leu	Asp Ile Lys Val	His	Thr Met Thr Arg	Glu Val Met Ser
1505		1510		1515

Asp	Glu	Leu	Thr	Lys	Leu	Leu	Glu	Gly	Asn	Leu	Lys	Pro	Ala	Ile
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Asp	Met	Met	Val	Glu	Phe	Asn	Thr	Thr	Gly	Ser	Leu	Pro	Glu	Asn
1535						1540					1545			
Ala	Val	Asp	Val	Leu	Asn	Thr	Ala	Leu	Gly	Asp	Arg	Lys	Ser	Phe
1550						1555					1560			
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1565						1570					1575			
Glu	Asp	Lys	Ser	Ala	Phe	Val	Thr	Pro	Leu	Tyr	Val	Glu	Ala	Asp
1580						1585					1590			
Gly	Val	Thr	Asn	Gly	Pro	Ile	Asn	Ala	Met	Met	Leu	Met	Thr	Gly
1595						1600					1605			
Gly	Leu	Phe	Thr	Pro	Asp	Trp	Ile	Arg	Asn	Ile	Ala	Lys	Gly	Gly
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1625						1630					1635			
Thr	Ala	Asp	Asn	Asn	Asp	Leu	Tyr	Gln	Ala	Ser	Thr	Asn	Ala	Leu
1640						1645					1650			
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1655						1660					1665			
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1670						1675					1680			
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Lys	Arg	Gly	Ile	Ala	Lys	Asn	Pro	Leu	Thr	Ile	Thr	Ile	Tyr	Gly
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Ser	Gly	Ala	Arg	Gly	Ile	Ala	Gly	Lys	Leu	Val	Ser	Ser	Val	Thr
1715						1720					1725			

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1730						1735					1740			
Lys	Asp	Pro	Asn	Ile	Ser	Ala	Ala	Met	Ala	Met	Phe	Gly	Lys	Gln
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1760						1765					1770			
Lys	Asp	Met	Glu	Thr	Leu	Thr	Ser	Thr	Val	Pro	Val	Lys	Arg	Lys
1775						1780					1785			
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1790						1795					1800			
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1820						1825					1830			
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1835						1840					1845			
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1880						1885					1890			
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1895						1900					1905			
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1910						1915					1920			
Val	Ala	Asn	Gln	Val	Leu	Ala	Thr	Asn	Leu	Asp	Asp	Arg	Met	Arg
1925						1930					1935			

Val	Pro	Met	Ser	Ile	Tyr	Ala	Pro	Ala	Gln	Ala	Gly	Val	Ala	Gly
1940						1945					1950			
Ile	Pro	Phe	Met	Thr	Ile	Gly	Thr	Gly	Asp	Gly	Met	Met	Met	Gln
1955						1960					1965			
Thr	Leu	Ser	Thr	Met	Lys	Gly	Ala	Pro	Lys	Asn	Thr	Leu	Lys	Ile
1970						1975					1980			
Phe	Asp	Gly	Met	Asn	Ile	Gly	Leu	Asn	Asp	Ile	Thr	Asp	Ala	Ser
1985						1990					1995			
Arg	Lys	Ala	Asn	Glu	Ala	Val	Tyr	Thr	Ser	Trp	Gln	Gly	Asn	Pro
2000						2005					2010			
Ile	Lys	Asn	Val	Tyr	Glu	Ser	Tyr	Ala	Lys	Phe	Met	Lys	Asn	Val
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Asp	Phe	Ser	Lys	Leu	Ser	Pro	Glu	Ala	Leu	Glu	Ala	Ile	Gly	Lys
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Ser	Ala	Leu	Glu	Tyr	Asp	Gln	Arg	Glu	Asn	Ala	Thr	Val	Asp	Asp
2045						2050					2055			
Ile	Ala	Asn	Ala	Ala	Ser	Leu	Ile	Glu	Arg	Asn	Leu	Arg	Asn	Ile
2060						2065					2070			
Ala	Leu	Gly	Val	Asp	Ile	Arg	His	Lys	Val	Leu	Asp	Lys	Val	Asn
2075						2080					2085			
Leu	Ser	Ile	Asp	Gln	Met	Ala	Ala	Val	Gly	Ala	Pro	Tyr	Gln	Asn
2090						2095					2100			
Asn	Gly	Lys	Ile	Asp	Leu	Ser	Asn	Met	Thr	Pro	Glu	Gln	Gln	Ala
2105						2110					2115			
Asp	Glu	Leu	Asn	Lys	Leu	Phe	Arg	Glu	Glu	Leu	Glu	Ala	Arg	Lys
2120						2125					2130			
Gln	Lys	Val	Ala	Lys	Ala	Arg	Ala	Glu	Val	Lys	Glu	Glu	Thr	Val
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Ser	Glu	Lys	Glu	Pro	Val	Asn	Pro	Asp	Phe	Gly	Met	Val	Gly	Arg
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Thr	Leu	Ala	Glu	Ile	Gln	Lys	Ser	Leu	Ala	Ala	Lys	Asp	Tyr	Lys
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Lys	Asn	Val	Thr	Glu	Leu	Thr	Ser	Gln	Glu	Met	Glu	Glu	Ala	Gln
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Ala	Gly	Asn	Ile	Tyr	Gly	Trp	Thr	Asn	Phe	Asp	Asp	Lys	Thr	Ile
2240						2245					2250			
Tyr	Leu	Val	Ser	Pro	Ser	Met	Glu	Thr	Leu	Ile	His	Glu	Leu	Val
2255						2260					2265			
His	Ala	Ser	Thr	Phe	Glu	Glu	Val	Tyr	Ser	Phe	Tyr	Gln	Gly	Asn
2270						2275					2280			
Glu	Val	Ser	Pro	Thr	Ser	Lys	Gln	Ala	Ile	Glu	Asn	Leu	Glu	Gly
2285						2290					2295			
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2300						2305					2310			
Glu	Met	Arg	Glu	Ala	Tyr	Ala	Asp	Ala	Ile	Ala	Thr	Ile	Glu	Gly
2315						2320					2325			
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Ala Ala Lys Gln Lys Arg Thr Ser Ser Leu Val Gln Met Val Lys  
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Asp Val Tyr Gln Ala Ile Lys Lys Leu Ile Trp Gly Arg Lys Gln  
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Ala Pro Ala Leu Gly Glu Asp Met Phe Ser Asn Leu Leu Phe Asn  
 2390 2395 2400

Ser Ala Ile Leu Met Arg Ser Gln Pro Thr Thr Gln Ala Val Ala  
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Lys Asp Gly Thr Leu Phe His Ser Lys Ala Tyr Gly Asn Asn Glu  
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Arg Leu Ser Gln Leu Asn Gln Thr Phe Asp Lys Leu Val Thr Asp  
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Tyr Leu Arg Thr Asp Pro Val Thr Glu Val Glu Arg Arg Gly Asn  
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Val Ala Asn Ala Leu Met Ser Ala Thr Arg Leu Val Arg Asp Val  
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Gln Ser His Gly Phe Asn Met Thr Ala Gln Glu Gln Ser Val Phe  
 2480 2485 2490

Gln Met Val Thr Ala Ala Leu Ala Thr Glu Ala Ala Ile Asp Pro  
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His Ala Met Ala Arg Ala Gln Glu Leu Tyr Thr His Val Met Lys  
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His Leu Thr Val Glu His Phe Met Ala Asp Pro Asp Ser Thr Asn  
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Pro Ala Asp Arg Tyr Tyr Ala Gln Gln Lys Tyr Asp Thr Ile Ser  
 2540 2545 2550

Gly Ala Asn Leu Val Glu Val Asp Ala Lys Gly Arg Thr Ser Leu  
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2630						2635					2640			
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Ala Met His Thr Gly Leu Gly Lys Thr Asp Leu Ala Val Leu Arg  
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Glu Thr Met Ser Met Ala Glu Ile Arg Asp Leu Leu Ser Ser Ser  
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Lys Lys Val Lys Asp Glu Ile Ser Thr Leu Glu Lys Glu Ile Gln  
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Asn Gln Ala Gly Arg Asn Trp Asn Leu Val Gln Lys Lys Ser Lys  
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Gln Leu Ala Gln Tyr Met Ile Met Gly Glu Val Gly Asn Asn Leu  
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Leu Arg Asn Ala His Ala Ile Ser Arg Leu Leu Gly Glu Arg Ile  
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Thr Asn Gly Pro Val Ala Asp Val Ala Ala Ile Asp Lys Leu Ile  
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Thr Leu Tyr Ser Leu Glu Leu Met Asn Lys Ser Asp Arg Asp Leu  
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Leu Ser Glu Leu Ala Gln Ser Glu Val Glu Gly Met Glu Phe Ser  
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Ile Ala Tyr Met Val Gly Gln Arg Thr Glu Glu Met Arg Lys Ala  
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Lys Gly Asp Asn Arg Thr Leu Leu Asn His Phe Lys Gly Tyr Ile  
2945 2950 2955

Pro Val Glu Asn Gln Gln Gly Val Asn Leu Ile Ile Ala Asp Asp  
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Lys Glu Phe Ala Lys Leu Asn Ser Gln Ser Phe Thr Arg Ile Gly  
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Val	Ala	Tyr	Glu	Gln	Ser	Val	Asp	Pro	Asn	Met	Leu	Lys	His	Leu
3080						3085					3090			
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3095						3100					3105			
Arg	Gln	Val	Glu	Glu	Ala	Lys	Ala	Gln	Arg	Phe	Asn	Asp	Ile	Leu
3110						3115					3120			
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Ser	Ala	Asn	Lys	Ser	Gln	Tyr	Val	Asn	Leu	Leu	Gly	Lys	Ile	Asp
3140						3145					3150			
Asp	Pro	Val	Leu	Ala	Asp	Ala	Ile	Asn	Leu	Met	Asn	Ile	Glu	Thr
3155						3160					3165			
Arg	His	Lys	Ala	Glu	Glu	Leu	Phe	Gly	Lys	Asp	Glu	Leu	Trp	Val
3170						3175					3180			
Arg	Arg	Asp	Met	Leu	Asn	Asp	Ala	Leu	Gly	Tyr	Arg	Ala	Ala	Ser
3185						3190					3195			

Ile Gly 3200	Asp Val Trp Thr	Gly 3205	Asn Ser Arg Trp	Ser 3210	Pro Ser Thr
Leu Asp 3215	Thr Val Lys Lys	Met 3220	Phe Leu Gly Ala	Phe 3225	Gly Asn Lys
Ala Tyr 3230	His Val Val Met	Asn 3235	Ala Glu Asn Thr	Ile 3240	Gln Asn Leu
Val Lys 3245	Asp Ala Lys Thr	Val 3250	Ile Val Val Lys	Ser 3255	Val Val Val
Pro Ala 3260	Val Asn Phe Leu	Ala 3265	Asn Ile Tyr Gln	Met 3270	Ile Gly Arg
Gly Val 3275	Pro Val Lys Asp	Ile 3280	Ala Val Asn Ile	Pro 3285	Arg Lys Thr
Ser Glu 3290	Ile Asn Gln Tyr	Ile 3295	Lys Ser Arg Leu	Arg 3300	Gln Ile Asp
Ala Glu 3305	Ala Glu Leu Arg	Ala 3310	Ala Glu Gly Asn	Pro 3315	Asn Leu Val
Arg Lys 3320	Leu Lys Thr Glu	Ile 3325	Gln Ser Ile Thr	Asp 3330	Ser His Arg
Arg Met 3335	Ser Ile Trp Pro	Leu 3340	Ile Glu Ala Gly	Glu 3345	Phe Ser Ser
Ile Ala 3350	Asp Ala Gly Ile	Ser 3355	Arg Asp Asp Leu	Leu 3360	Val Ala Glu
Gly Lys 3365	Ile His Glu Tyr	Met 3370	Glu Lys Leu Ala	Asn 3375	Lys Leu Pro
Glu Lys 3380	Val Arg Asn Ala	Gly 3385	Arg Tyr Ala Leu	Ile 3390	Ala Lys Asp
Thr Ala 3395	Leu Phe Gln Gly	Ile 3400	Gln Lys Thr Val	Glu 3405	Tyr Ser Asp

Phe Ile Ala Lys Ala Ile Ile Tyr Asp Asp Leu Val Lys Arg Lys  
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Lys Lys Ser Ser Ser Glu Ala Leu Gly Gln Val Thr Glu Glu Phe  
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Ile Asn Tyr Asp Arg Leu Pro Gly Arg Phe Arg Gly Tyr Met Glu  
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Ser Met Gly Leu Met Trp Phe Tyr Asn Phe Lys Ile Arg Ser Ile  
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Lys Val Ala Met Ser Met Ile Arg Asn Asn Pro Val His Ser Leu  
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Ile Ala Thr Val Val Pro Ala Pro Thr Met Phe Gly Asn Val Gly  
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Leu Pro Ile Gln Asp Asn Met Leu Thr Met Leu Ala Glu Gly Arg  
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Leu Asp Tyr Ser Leu Gly Phe Gly Gln Gly Leu Arg Ala Pro Thr  
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